Dental Health and Public Policy: The Social Impact of Dental Disease

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Abstract: This paper analyzes the potential of using measures of social function as health indicators in dental research. It discusses existing methodologies and presents findings from a cross-section of studies that adopt a social function perspective in the investigation of oral health status.

While the literature in this area is small, much of the research concerns disability days associated with dental problems. The United States National Health Interview Survey reported in 1981 that 4.87 million dental conditions caused 17.7 million days of restricted activity, 6.73 million days of bed disability, and 7.05 million days of work loss. Other reports suggest that these data may be underestimates due to the National Health Survey's definition of disability days. Several other studies have found work loss to affect from 15 per cent to 33 per cent of samples studied resulting in many more work loss days than reported by the National Health Survey. Our study concludes that traditional measures of oral health status—such as decayed, missing, and filled teeth and the periodontal index—should be linked to measures of social outcome in order to place dental conditions within the broader context of health status in terms that are relevant to policy makers. (*Am J Public Health* 1985; 75:27–30.)

Introduction

More than 20 years ago, the World Health Organization developed a definition of health as a "state of complete physical, mental and social well-being and not merely the absence of disease and illness".[1] This definition reflected a movement in western medicine to promote a broad view of health that went beyond apparent morbidity and resulted in efforts to define health status in terms of psychological, social, and physical functioning.

In recent years, considerable progress has been made in developing functional measures of health. Most noteworthy has been the formulation of health status indicators that assess how illnesses or conditions interfere with normal functioning. Several major studies have quantified the social consequences of disease through activity limitations in daily living.[2–5*]

While research in health status has included a broad spectrum of chronic and acute conditions, relatively little attention has been given to the social impact of oral health problems. Traditionally, oral health has been measured on the basis of tissue pathology with limited recognition of the broader social implications of this pathology.

Yet dental problems are characterized by high prevalence among both children and adults. Although they are seldom life-threatening, many are chronic; typically they have acute stages that are treatable and of short duration. Because of these characteristics, other chronic conditions are usually considered more serious public health problems by policy makers.

The purpose of this paper is to explore the social consequences of oral conditions beginning with a review of the literature on social impacts including both disruptions in normal social functioning and social discrimination, and concluding with a discussion of conceptual, methodological, and policy issues.

*Chen K, Yang L: An outcome-based index of quality of health care, Unpublished Manuscript, 1978.

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Research on the Social Impact of Dental Disease

For the most part, the term dental will be used in the paper to refer to conditions of the teeth and mouth. This is based on the conventional usage of this term by the National Center for Health Statistics when reporting findings associated with the oral-facial region. While a conceptual distinction can be made between diseases of the teeth and supporting structure (dental diseases) and oral-facial deformities such as malocclusions or cleft lip and palate, only one term, dental, will be used.

The studies on the social impact of dental disease can be categorized into two general topics: reports on limitations in social functioning, and patterns of social discrimination in adults and students.

Social Functioning

The United States National Health Survey (NHS)[6] measures the impact of acute conditions in terms of disability days. Commenting on the value of disability days as a measure of health, Sullivan of the National Center for Health Statistics noted, "The decision to reduce usual activities reflects the individual's attitude toward illness and self-care, the knowledge or beliefs about the symptoms present, and other social and cultural factors. Disability measures reflect the impact of morbid conditions as they influence the social participation of members of the population. In this respect they measure an aspect of morbidity important in any evaluation of the health status of a population."[7]

Table 1 presents NHS data on acute dental conditions and two other acute conditions. In 1981, 4.87 million acute dental conditions caused 17.7 million days of restricted activity, 6.73 million days of bed disability, and 7.05 million days of work loss. Table 1 compares two other acute disorders selected on the basis of their similarities to acute dental conditions (relatively short duration and being readily treatable).

Acute genitourinary conditions are more prevalent and cause more disability than dental conditions or gastrointestinal disorders. Gastrointestinal disorders occur more than twice as frequently as dental conditions but result in proportionately fewer disability days. These comparisons suggest that the nature and course of the disease process is highly relevant to its social consequences. Dental conditions emerge as having substantial impact, especially in the work area: almost one and a half days are lost for every acute dental condition reported.

TABLE 1—Disability Days Associated with Acute Dental Conditions* Genitourinary Conditions, and Gastrointestinal Disorders, 1981

	Dental Conditions*	Genitourinary Conditions	Gastrointestinal Disorders
Conditions**	2.2	5.8	5.0
Restricted Activity**	7.9	31.5	12.1
Bed Disability**	3.0	15.3	5.1

*Dental conditions include disturbances in tooth eruption, hypercementosis, gingival and periodontal diseases, dentofacial anomalies (including malocclusion), and other diseases of teeth and supporting structures (including caries) but are reported as one general group of acute dental conditions. Data on disability from caries or other specific dental conditions have not been published.

**Per 100 persons.

SOURCE: US Department of Health and Human Services, National Center for Health Statistics: Current Estimates from the National Health Survey, United States, 1981. Hyattsville, MD: NCHS, October 1982.

The National Health Survey reports dental disability days only for acute dental problems, despite the fact that most oral diseases are chronic degenerative conditions with recurrent acute episodes. Considering only acute dental problems probably underestimates the disabilities caused by oral disorders.

An analysis of work disability associated with oral conditions is being initiated by the National Center for Health Statistics (NCHS). Unpublished findings provided by NCHS in Table 2** indicate that for 1980 there were 7.045 million days lost from work due to acute and chronic oral conditions. Males appear to have more disability for toothaches and diseases of the jaw and salivary glands, while females tend to have work loss due to "other conditions" which include diseases of hard tissue, disorders of tooth eruption, pulp disease, and gingival and periodontal diseases.

Data are also available on disability days for full-time housewives unable to perform household duties. There were 1.8 million disability days or 2.7 per full-time housewife for both acute and chronic oral conditions. Thus, oral diseases interfere in a very significant way with performance of every day tasks.

Table 3 presents a comparison from the NHS of work loss days from dental conditions to work loss days resulting from two markedly different conditions: neoplasms and stroke. This comparison is not intended to equate the social meaning or clinical severity of these conditions but to illustrate how the societal impacts of these diseases are similar. The results are striking in that oral conditions cause more work loss days than stroke. Also, in comparison to both neoplasms and stroke, work loss for oral conditions occur in the younger age groups, at the height of career productivity.

There are several drawbacks to the NHS data. Because definitions of restricted activity require at least a half day of work loss or whole day of restricted activity, functional limitations whose duration are less than this period are not counted. Because of the nature of oral conditions and their treatment, dysfunction may not last all day. Thus, a large amount of dental disability either may be unreported or is underreported.

The first major study to specifically examine the social impact of oral conditions is now underway in Connecticut. Reisine and her colleagues are conducting a telephone survey of 2,541 employed people in the Hartford area.[8] Preliminary results from the baseline interview indicate that 25 per cent of employed adults reported some time lost from work in the past 12 months. Almost all causes of work loss were related to preventive and treatment dental visits which took place during working hours, but 9 per cent reported that conditions and related symptoms were severe enough to warrant convalescence at home.

TABLE 2—Work Loss Days due to Acute and Chronic Conditions in the United States, 1980 (in thousands)

Condition	Males	Females	Total
Toothache	1,038	727	1,765
Diseases of Jaw Salivary Glands, etc.	151	—	151
Other Diseases	2,007	3,122	5,129
Total	3,196	3,849	7,045
Per 100/Yr.	5.73	9.2	7.22

Overall, there were 4,320 hours lost from work, most of which were attributable to dental visits. While preventive visits account for most episodes (62.8 per cent) of work absence, they result in the fewest hours lost (32.3 per cent).

From the perspective of societal impact, another important finding is that dysfunctions may be limited to brief episodes for the individual; 1.7 hours are lost from work per person per year over the whole subsample. On an individual level, the consequences of disability may be tolerable. On an aggregate level, however, the impact is overwhelming. Consider that in 1981 there were approximately 100 million employed persons. If each one lost a half day each year because of dental visits or disabling symptoms, it would amount to a very significant cost to industry and society.

Bailit, *et al**** recently completed a report for the Robert Wood Johnson Foundation on work loss and dental disease. The objective of the study was to identify the magnitude, causes, and possible strategies for reducing work absence related to dental problems. Seven major data sources were investigated including: the National Health Survey, Reisine's study of Connecticut, Conrad's study of Blue Cross/Blue Shield subscribers, R. J. Reynolds Industries health services program, a case study of an automotive parts company, Rand Health Insurance Study, National Medical Care Expenditure Study. The conclusions of the study are based mainly on the results of Reisine's study and the case study of the automotive parts company. Rates of dental work loss were found to vary from 15 per cent to 33 per cent of the populations studied; work impact appeared to be greatest for blue collar workers who risk loss of income and fringe benefits, as well as their jobs, for dental visits during working hours. This is consistent with the general work disability literature which indicates that control over the work place is an important predictor of work disability.

Two other studies have included oral conditions in their assessment of diseases that affect social functioning. Gerson[9] asked participants to rate how seven health problems would affect their ability to perform work and household tasks. On average, the respondents expected dental conditions to reduce functioning on the job during acute and convalescent phases of illness. One specific condition, impacted wisdom teeth, was considered to have more impact

**Personal communication.

***Bailit HL, *et al:* Final Report Work Loss and Dental Disease. Princeton, NJ: Robert Wood Johnson Foundation, unpublished, 1982.

TABLE 3—Work Loss Days Related to Selected Conditions by Age, (in thousands)

Age (years)	All Neoplasms*	Stroke**	Oral Conditions**
15–24	1,592	—	2,767
25–44	5,433	727	2,897
45–64	7,937	2,635	1,287
65+	1,380	137	260
Total	16,380	3,499	7,211

*1977 data.
**1976–77 average. Age breakdown available only for this period.
SOURCE: Division of Analysis, National Center for Health Statistics, National Health Interview Survey, Hyattsville, MD, NCHS.

than ulcers, arthritis, and trench mouth. Low status workers expected more exemptions from work tasks than high status workers. Race and sex had no significant effect.

A study of 62 Dutch Army recruits examined the influence of dental diseases on daily life activities.† Participants were asked to rate the impact of oral conditions on selected tasks based on the respondents' experience or expectation and not on impact related to current conditions. The daily life functions were based on the Sickness Impact Profile.[3] Dental problems were reported as having their greatest impact on eating, sleeping, and resting. However, dental conditions also affected work absence and performance, leisure activities, social contacts, emotional behavior, and mobility.

Two studies have reported the influence of oral conditions on school work, an aspect of social dysfunction pertinent to children. A study of Indian high school students showed that academic performance worsened as the number of dental problems increased.[10] California University students reported that the pain and headaches associated with temporal mandibular joint problems interfered with sleeping and work activities.[11] Unpublished National Health Survey reports indicated that dental conditions resulted in 1.57 million days of school loss in 1980 or four days per 100 school children per year.††

The studies on academic performance have many of the same problems as other studies on social dysfunction. Specifically, the nature and severity of dental problems are not documented and they are considered acute rather than chronic conditions.

Although these studies document a significant amount of functional impairment associated with dental problems, very little is known about the types, nature, or symptoms of oral conditions causing social dysfunction on an individual level. Even less is known about the related repercussions for the family, community, and society.

Social Discrimination

There is a fairly large literature[12] on how congenital oral-facial anomalies and malocclusions affect perceptions of self and of others with deviations from normative facial patterns. Rutzen[13] examined the social effects of malocclusion by comparing treated and untreated persons in the following areas: several measures of social rank, measures of courtship status including marital status, and measures of self-esteem and personality. (The various measures in all these areas served as indicators of social discrimination.) The treated group tended to view themselves more favorably; however, there were barely significant differences in occupational status (but not in other social class or educational level), in engagement and marriage (but not in other dating patterns), in assessment of personal appearance (but not in self-esteem). There were some methodological aspects that could have affected the results. Differences between the groups were tested five years after treatment which may not have allowed time for patterns of social discrimination to develop. There were no untreated control group that did not require orthodontic treatment. The conceptual and operational indicators of social discrimination mentioned above may not have been sensitive enough to detect differences.

Peter and Chinsky compared the courtship patterns of adults with cleft lips and palates to the patterns of normal sibs and a control group.[14] Participants with facial defects were more likely to remain single, marry later, and have childless marriages than comparison groups. Richman[15] examined perceived social adjustment, speech problems, and personality assessment in 30 adolescents with cleft lip and palate. The results showed participants with clefts experienced social adjustment problems related to concerns about facial appearance. Facial concerns were more important than speech concerns in predicting social introversion.

These studies suggest that the type and severity of conditions may influence the scope of social consequences. Individuals with oral-facial clefts are aware of their conditions from an earlier point in the life cycle compounding the social impact of the condition in later life.

Discussion

The perceptions which explain why functional disability caused by dental disease has not been incorporated into health status indexes have been articulated by Davis.[16, 17] He argues that, because dental conditions are commonly experienced by most individuals and are not life-threatening, the types of functional role adjustments seen for other more serious conditions are not taken for dental diseases. For example, because individuals are held responsible for their dental health status to some extent, sick role behavior is not acceptable for most dental conditions. Nonetheless, as we have seen, the empirical evidence suggests that dental conditions have a significant impact on functioning. NHS data indicate that toothaches alone cause 17.7 million days of restricted activity, a serious health problem on a societal level. Further research is needed to identify the causes of such disability and the social factors affecting the decision to limit activity due to dental problems.

Another problem is the lack of a theoretical paradigm for measuring social impact. The problem is two-fold: identifying a valid indicator of oral health, and joining it to a relevant indicator of social impact. One approach is based on role theory which defines social impact as the extent to which oral conditions disrupt normal social functioning.[18,19]

This general strategy is used in other measures of illness impact. The Sickness Impact Profile (SIP),[2,3] for example, consists of 12 dimensions, assessing performance of daily activities. These include such areas as physical and psychosocial functioning and ability to work, eat, and sleep. These dimensions, derived from surveys of patients and providers, are intended to reflect the impact of illness on everyday life. There are many other scales of this type that attempt to measure the impact of disease and treatments.[4–5]

†Schaub R: The sickness impact profile and the effect of dental conditions of army recruits in Holland, unpublished paper, 1981.

††Personal communication.

This approach can be applied to dental conditions, as well, by identifying life domains[17,18] where impact of disease is likely to occur and specifying indicators of impact. Based on the SIP, five major areas of social function are the family, work, leisure, community, and society.

In the family domain, for example, periodontal surgery might affect child care functions or result in several days of work absence. Other examples could be chosen reflecting age, sex, and social status. This conceptualization represents an initial stage of formulating more comprehensive and sophisticated indexes. Factors, such as the severity of the condition, sociodemographics, and validity and reliability of the indicators need to be developed further.

A final problem in developing social indicators of dental disease impact is that dentistry has remained isolated from the mainstream of research in this area. In part, this results from the previously discussed perceived triviality of dental conditions. It also reflects the development of medicine and dentistry as separate disciplines. The distinction between oral health and general health is an arbitrary delineation which should be eliminated. An integrated approach could provide many insights into how dental diseases affect health status and social functioning in the context of other conditions. For example, Greene and Laskin,[20] in analyzing the medical histories of 100 myofacial pain disorder (MPD) patients found that they had a history of many past and present physical complaints. These patients reported frequent episodes of hospitalization and psychiatric counseling or therapy suggesting that MPD treatment is but one dimension of complex social patterns of illness behavior. Further, as Cohen and Jago[21] point out, oral conditions, due to their chronic nature with recurring acute episodes, could provide an easily observable, self-limiting testing ground for learning more about how individuals cope with degenerative disease or comply with home health regimens.

The policy implications of the social approach to measuring the impact of oral conditions are significant. It is widely accepted that cancer, heart disease, and stroke have large and serious consequences in terms of mortality, morbidity, disability, and treatment costs. The conditions are personally devastating in these and other ways to the individual. However, the social costs of dental conditions may be as great as cancer and heart disease from the perspective of societal health objectives.

This argument returns to the initial discussion of the meaning of oral health problems in connection with the development of social policy. There are many conditions where the impacts on the individual are self-evident in terms of mortality, health services expenditures, and disability. However, these conditions (cancer, for example) affect a smaller segment of society than dental disease. If oral health status is presented in terms of social consequences, as well as the traditional clinical indicators, a more effective argument can be made to secure public and private funds needed to support dental research and treatment programs. Placing dental conditions in the context of inability to function will provide dentistry with greater visibility and legitimacy in an integrated federal or state policy on the population's health.

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